ET930

Intel® HM76

COM-Express Module

USER'S MANUAL

Version 1.0

Acknowledgments

AMI is a registered trademark of American Megatrends Inc.
PS/2 is a trademark of International Business Machines Corporation.
Intel and Intel® Ivy Bridge DC Mobile Processor are registered trademarks of Intel Corporation.
Microsoft Windows is a registered trademark of Microsoft Corporation.
All other product names or trademarks are properties of their respective owners.

Table of Contents

Introduction 1

Product Description 1
Checklist 2
ET930 Specifications 3
Board Dimensions 4

Installations 6

Installing the Memory 7
Setting the Jumpers 8
Jumper Locations on ET930 9

BIOS Setup 11

Drivers Installation 35

Intel Chipset Software Installation Utility 36
VGA Drivers Installation 39
Realtek HD Audio Driver Installation 42
LAN Drivers Installation 44
Intel® USB 3.0 Drivers 48

Appendix 51

A. I/O Port Address Map 51
B. Interrupt Request Lines (IRQ) 52
C. Watchdog Timer Configuration 53

This page is intentionally left blank.

Introduction

Product Description

The ET930 COM-Express Module is based on the latest Intel® HM76 chipset with pin-out Type 6 that fully complies with the PICMG (PCI Industrial Computer Manufactures Group) COM.0 R2.0 specification.. The platform supports 3rd generation Intel® Core processor family with BGA packing and feature an integrated dual-channel DDR3 memory controller as well as a graphics core.

The latest Intel® processors provide advanced performance in both computing and graphics quality. This meets the requirement of customers in the gaming, POS, digital signage and server market segment.

The HM76 platform is made with 22-nanometer technology that supports Intel's first processor architecture to unite the CPU and the graphics core on the transistor level. The ET930 COM-Express Module utilizes the dramatic increase in performance provided this Intel's latest cutting-edge technology. Measuring 125mm x 95mm, the ET930 offers fast 6Gbps SATA, USB3.0 and DisplayPort. ET930 features Intel Active Management Technology 8.0.

ET930 FEATURES:

- Supports Intel® 3rd Generation Core i7/i5/i3 QC/DC mobile processors
- Two DDR3 SO-DIMM, 1066/1333/1600MHz, Max. 16GB memory
- Intel® PCI-Express Gigabit LAN
- Integrated Graphics for VGA/DisplayPort/LVDS displays
- 2x SATA 2.0, 2x SATA 3.0, 8x USB 2.0, USB 3.0 (4 ports)
- 1x PEG (x16), 7x PCI-EX1

Checklist

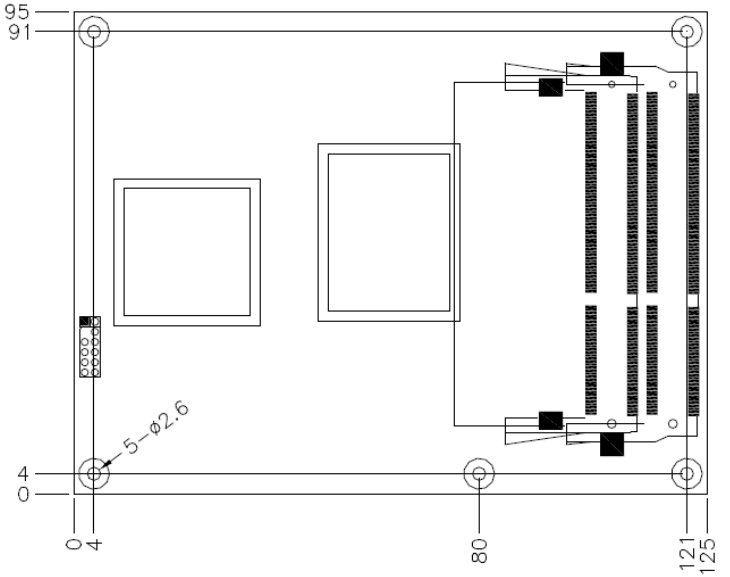
Your ET930 package should include the items listed below.

- The ET930 COM-Express Module
- This User's Manual
- 1 CD containing chipset drivers and flash memory utility
- 1 heat-spreader

ET930 Specifications

Product Name	ET930-1G (Celeron-807UE, SC, TDP=10W) ET930-13 (i3-2340UE, DC, TDP=17W) ET930-16 (i3-3217UE, DC, TDP=17W)
Form Factor	COM Express Type VI
CPU Type	- Intel® Celeron® 807UE (1.0GHz, 1C/1T, 1MB cache, TDP=10W) - Intel® Core™ i3-2340UE (1.3GHz, 2C/4T, 3MB cache, TDP=17W) - Intel® Core™ i3-3217UE (1.6GHz, 2C/4T, 3MB cache, TDP=17W) - BGA1023 , 32nm, 31mm x 24mm
Chipset	Intel® BD82HM76 PCH - 25mm x 25mm , TDP = 3.9W
BIOS	AMI BIOS
Memory	DDR3-1333/1600 SO-DIMM x 2, Max. 8GB (Non-ECC) , single-channel, horizotal type
VGA	Intel® CPU integrated HD graphic, support dual independent displays Thru interface on carrier board
LVDS	Intel® BD82HM76 built-in 24-bit dual channels Thru interface on carrier board
LAN	Intel® 82579V PHY GbE x 1 Thru interface on carrier board
USB	Intel® BD82HM76 PCH built-in USB host controller, supports USB 3.0 x 4 ports & USB 2.0 x 8 ports
Serial ATA Ports	Intel® BD82HM76 PCH built-in controller, Supports 2 ports for SATA 2.0 (3Gb/sec.) 2 ports for SATA 3.0 (6Gb/sec.)
Audio	Intel® BD82HM76 PCH Built-in HD Audio controller with external HD codec on carrier board
RTC	Intel® BD82HM76 PCH built-in RTC, battery on carrier board
Connector to Carrier Board	Two 220-pin connectors (A-B & C-D) [COM Express 2.0 standard]
Power	+12V ,+5VSB
Others	heat-spreader
RoHS	Yes
Board Size	95mm x 125mm
OS support	Windows XP ; Windows 7 , Windows 8, Linux

Board Dimensions



This page is intentionally left blank.

Installations

This section provides information on how to use the jumpers and connectors on the ET930 in order to set up a workable system. The topics covered are:

Installing the Memory 7
Setting the Jumpers 8
Jumper Locations on ET930 9
JP1: SPI Flash connector (Factory use only) 10
J3: Flash Descriptor Security Override (Factory use only) 10

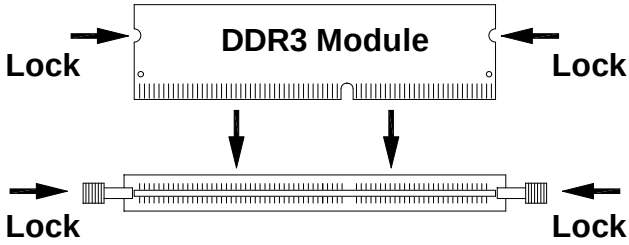
Installing the Memory

The ET930 board supports two DDR3 memory socket for a maximum total memory of 16GB in DDR3 SO-DIMM memory type.

Installing and Removing Memory Modules

To install the DDR3 modules, locate the memory slot on the board and perform the following steps:

1. Hold the DDR3 module so that the key of the DDR3 module aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module, press the clips with both hands.

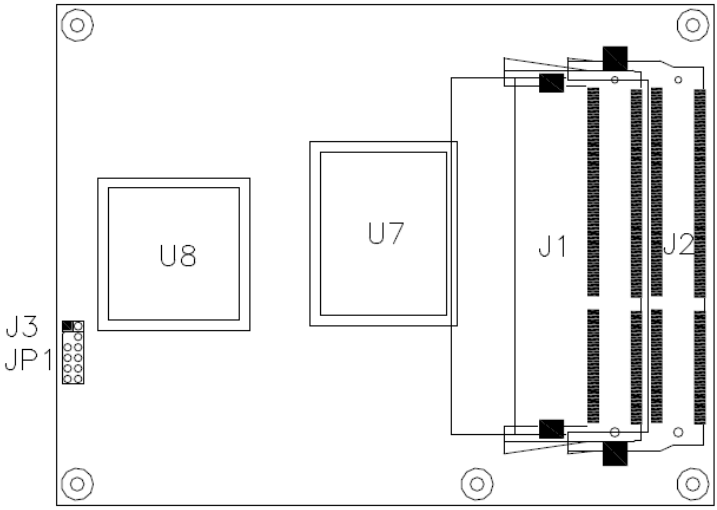


Setting the Jumpers

Jumpers are used on ET930 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on ET930 and their respective functions.

Jumper Locations on ET930 9
JP1: SPI Flash connector (Factory use only) 10
J3: Flash Descriptor Security Override (Factory use only) 10

Jumper Locations on ET930



Jumpers on ET930 ..... Page
JP1: SPI Flash connector (Factory use only) 10
J3: Flash Descriptor Security Override (Factory use only) 10

JP1: SPI Flash connector (Factory use only)

J3: Flash Descriptor Security Override (Factory use only)

J3	Flash Descriptor Security Override
Open	Disabled (Default)
Close	Enabled

BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction..... 12
BIOS Setup..... 12
Advanced Settings 14
Chipset Settings..... 24
Boot Settings 30
CSM parameters 31
Security Settings..... 32
Save & Exit Settings..... 33

BIOS Introduction

The BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

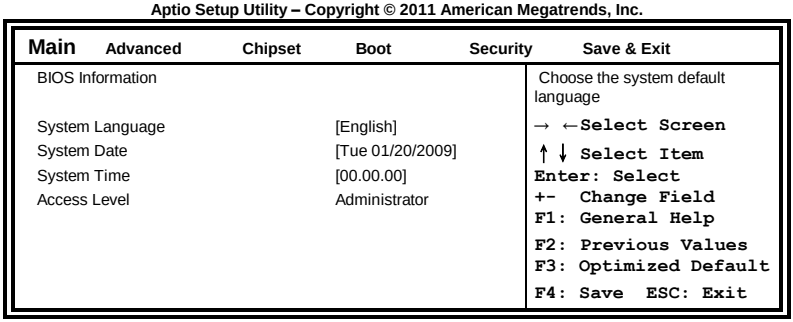
```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Main Settings



System Language

Choose the system default language.

System Date

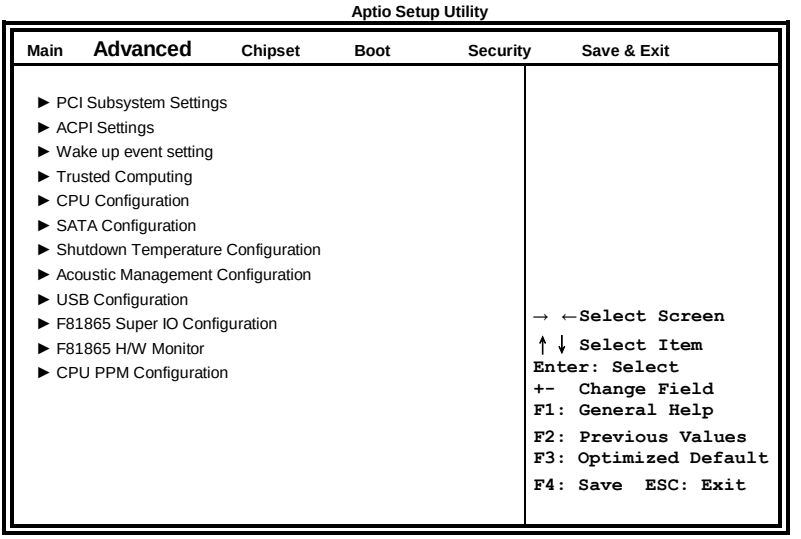
Set the Date. Use Tab to switch between Data elements.

System Time

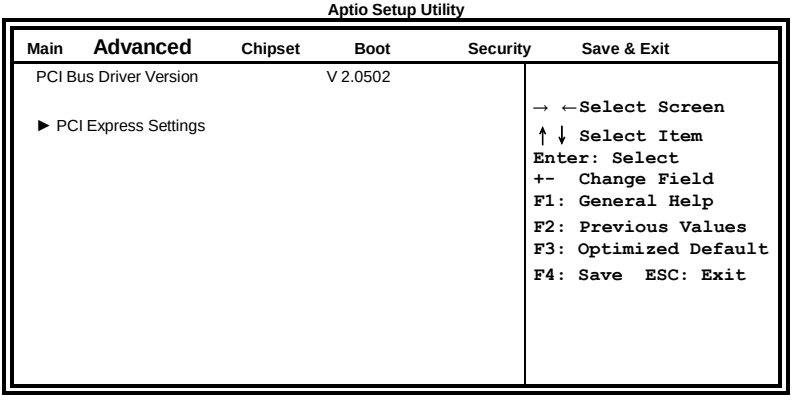
Set the Time. Use Tab to switch between Data elements.

Advanced Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



PCI Subsystem Settings



PCI Express Settings

Change PCI Express devices settings.

PCI Express Settings

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
PCI Express Device Register Settings					
Relaxed Ordering			Disabled		
Extended Tag			Disabled		
No Snoop			Enabled		
Maximum Payload			Auto		
Maximum Read Request			Auto		
PCI Express Link Register Settings					
ASPM Support			Disabled		
WARNING: Enabling ASPM may cause some PCI-E devices to fail			Disabled		
Extended Synch			Disabled		
Link Training Retry			5		
Link Training Timeout (uS)			100		
Unpopulated Links			Keep Link ON		

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

Relaxed Ordering
Enables or disables PCI Express Device Relaxed Ordering.

Extended Tag
If ENABLED allows device to use 8-bit Tag field as a requester.

No Snoop
Enables or disables PCI Express Device No Snoop option.

Maximum Payload
Set Maximum Payload of PCI Express Device or allow System BIOS to select the value.

Maximum Read Request
Set Maximum Read Request Size of PCI Express Device or allow System BIOS to select the value.

ASPM Support
Set the ASPM Level: Force L0s – Force all links to L0s State:
AUTO – BIOS auto configure : DISABLE – Disables ASPM.

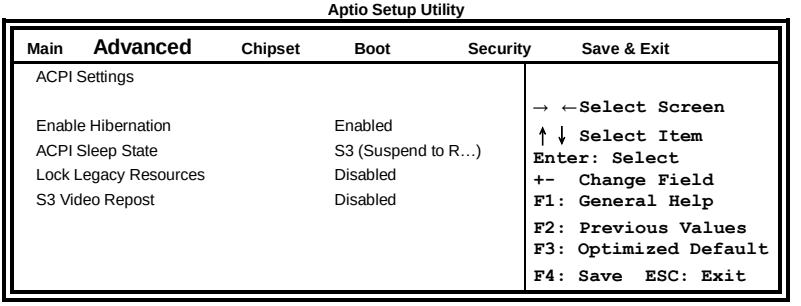
Extended Synch
If ENABLED allows generation of Extended Synchronization patterns.

Link Training Retry
Defines number of Retry Attempts software will take to retrain the link if previous training attempt was unsuccessful.

Link Training Timeout (uS)
Defines number of Microseconds software will wait before polling 'Link Training' bit in Link Status register. Value range from 10 to 1000 uS.

Unpopulated Links
In order to save power, software will disable unpopulated PCI Express links, if this option set to 'Disable Link'.

ACPI Settings



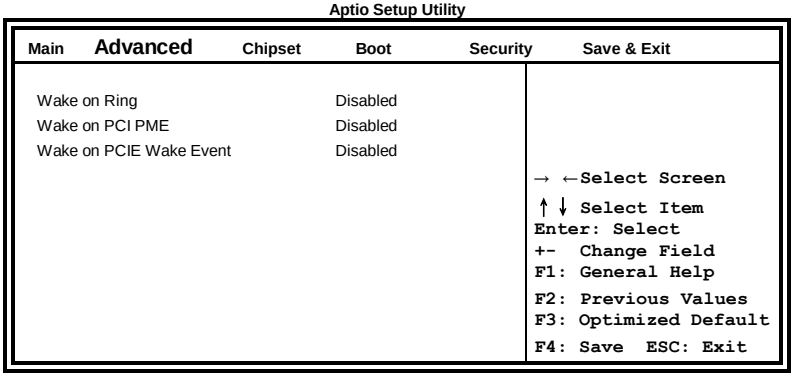
Enable Hibernation
Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State
Select ACPI sleep state the system will enter, when the SUSPEND button is pressed.

Lock Legacy Resources
Enabled or Disabled Lock of Legacy Resources.

S3 Video Repost
Enable or disable S3 Video Repost.

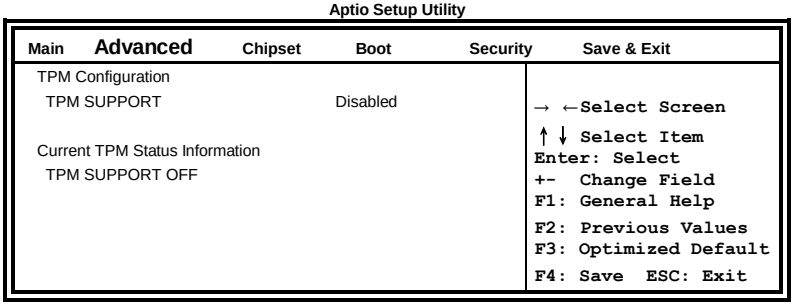
Wake up event settings



Wake on PCIE PME Wake Event

The options are Disabled and Enabled.

Trusted Computing



TPM Support

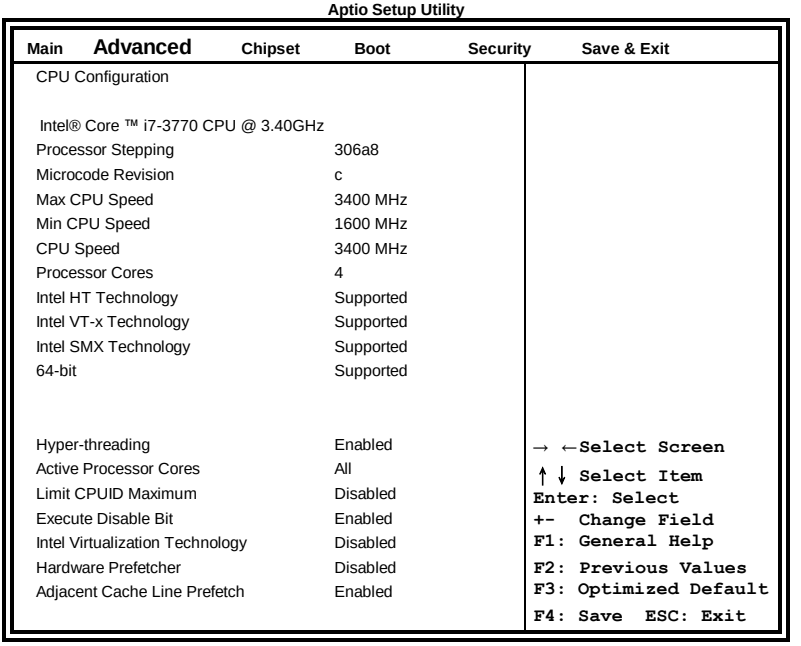
This configuration is supported only with MB970VF. Enables or Disables TPM support. O.S. will not show TPM. Reset of platform is required.

Security Device Support

Enables or disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

CPU Configuration

This section shows the CPU configuration parameters.



Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology). When Disabled, only one thread per enabled core is enabled.

Active Processor Cores

Number of cores to enable in each processor package.

Limit CPUID Maximum

Disabled for Windows XP.

Execute Disable Bit

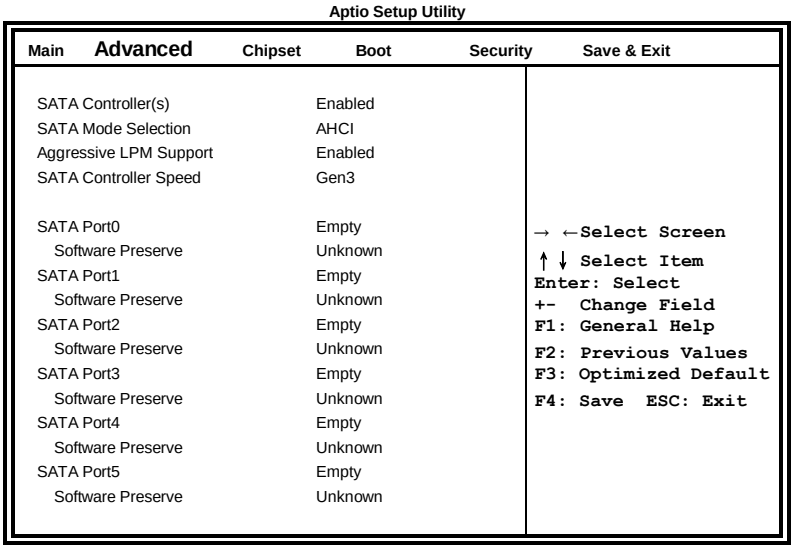
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, Re33dHat Enterprise 3 Update 3.)

Intel Virtualization Technology
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Hardware Prefetcher
To turn on/off the Mid level Cache (L2) streamer Prefetcher.

Adjacent Cache Line Prefetch
To turn on/off prefetching of adjacent cache lines.

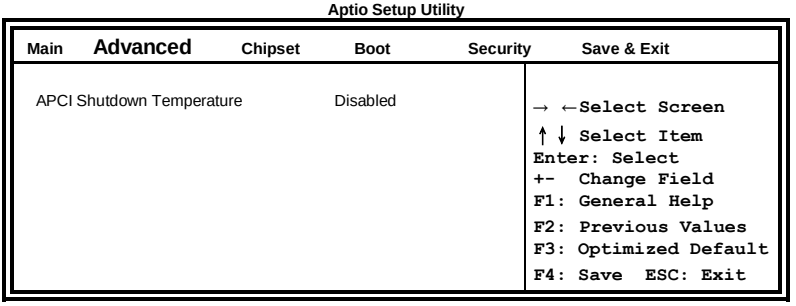
SATA Configuration
SATA Devices Configuration.



SATA Controller(s)
Enable / Disable Serial ATA Controller.

SATA Mode Selection
(1) IDE Mode.
(2) AHCI Mode.
(3) RAID Mode.

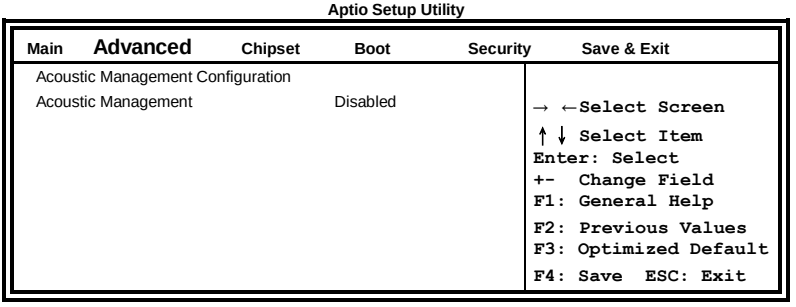
Shutdown Temperature Configuration



ACPI Shutdown Temperature

The default setting is Disabled.

Acoustic Management Configuration



USB Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit

USB Configuration		
USB Devices:		
2 Hubs		
Legacy USB Support	Enabled	
USB3.0 Support	Enabled	
XHCI Hand-off	Enabled	→ ←Select Screen
EHCI Hand-off	Enabled	↑ ↓ Select Item
Port 60/64 Emulation	Enabled	Enter: Select
		+- Change Field
USB hardware delays and time-outs:		F1: General Help
USB Transfer time-out	20 sec	F2: Previous Values
Device reset tine-out	20 sec	F3: Optimized Default
Device power-up delay	Auto	F4: Save ESC: Exit

Legacy USB Support

Enables Legacy USB support.
AUTO option disables legacy support if no USB devices are connected.
DISABLE option will keep USB devices available only for EFI applications.

USB3.0 Support

Enable/Disable USB3.0 (XHCI) Controller support.

XHCI Hand-off

This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

EHCI Hand-off

Enabled/Disabled. This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

Port 64/60 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

USB Transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers.

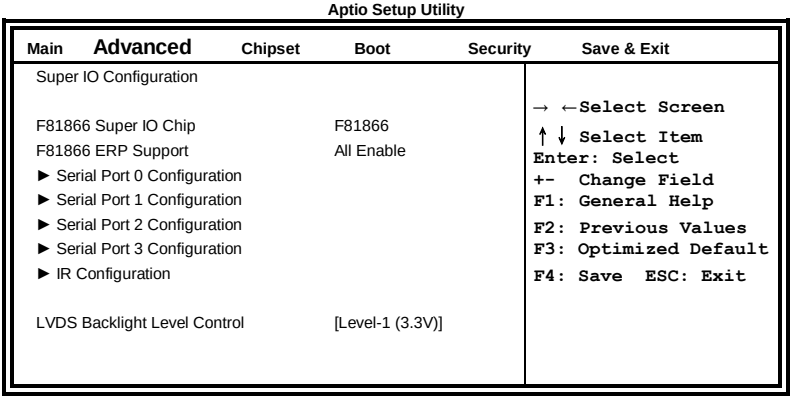
Device reset tine-out

USB mass Storage device start Unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

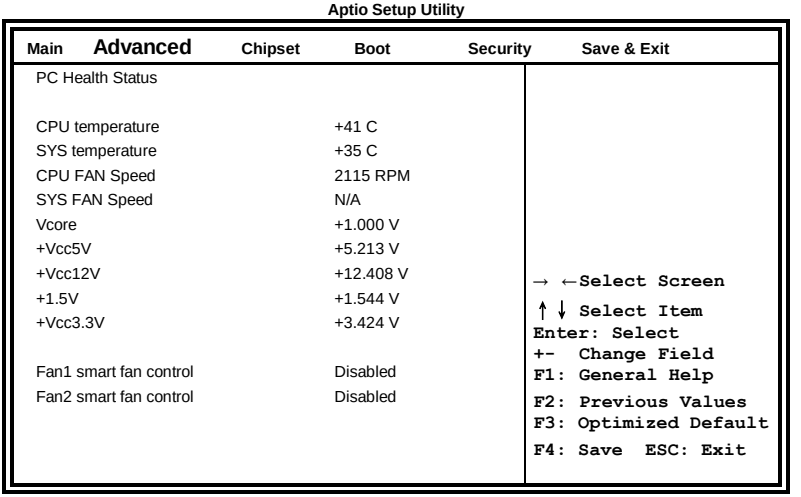
F81866 Super IO Configuration


Aptio Setup Utility
Main Advanced Chipset Boot Security Save & Exit
Super IO Configuration
F81866 Super IO Chip F81866
F81866 ERP Support All Enable
► Serial Port 0 Configuration
► Serial Port 1 Configuration
► Serial Port 2 Configuration
► Serial Port 3 Configuration
► IR Configuration
LVDS Backlight Level Control [Level-1 (3.3V)]
→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

Serial Port Configuration

Set Parameters of Serial Ports. User can Enable/Disable the serial port and Select an optimal settings for the Super IO Device.

F81866 H/W Monitor



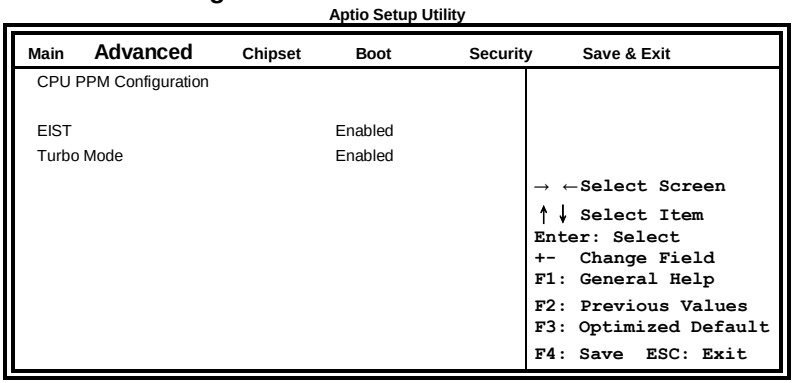
Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

Fan1/Fan2 Smart Fan Control

This field enables or disables the smart fan feature. At a certain temperature, the fan starts turning. Once the temperature drops to a certain level, it stops turning again.

CPU PPM Configuration

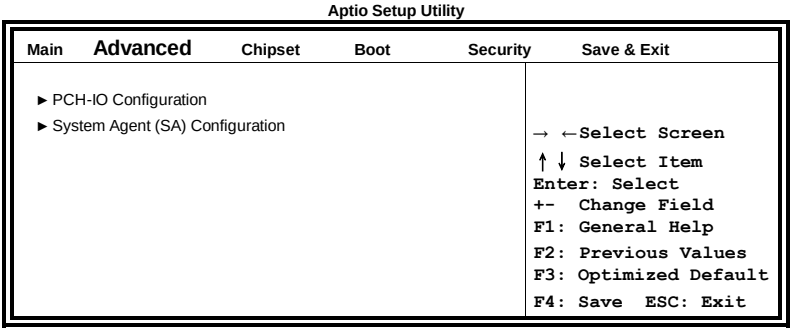


EIST

Enable/Disable Intel SpeedStep.

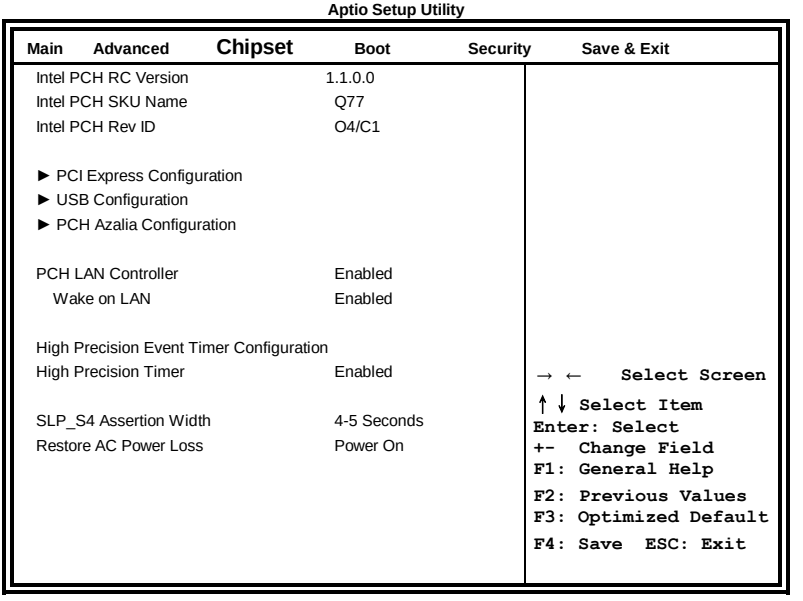
Chipset Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.



PCH-IO Configuration

This section allows you to configure the North Bridge Chipset.


Aptio Setup Utility
Main Advanced Chipset Boot Security Save & Exit
Intel PCH RC Version 1.1.0.0
Intel PCH SKU Name Q77
Intel PCH Rev ID O4/C1
► PCI Express Configuration
► USB Configuration
► PCH Azalia Configuration
PCH LAN Controller Enabled
Wake on LAN Enabled
High Precision Event Timer Configuration
High Precision Timer Enabled
SLP_S4 Assertion Width 4-5 Seconds
Restore AC Power Loss Power On
→ ← Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

PCH LAN Controller

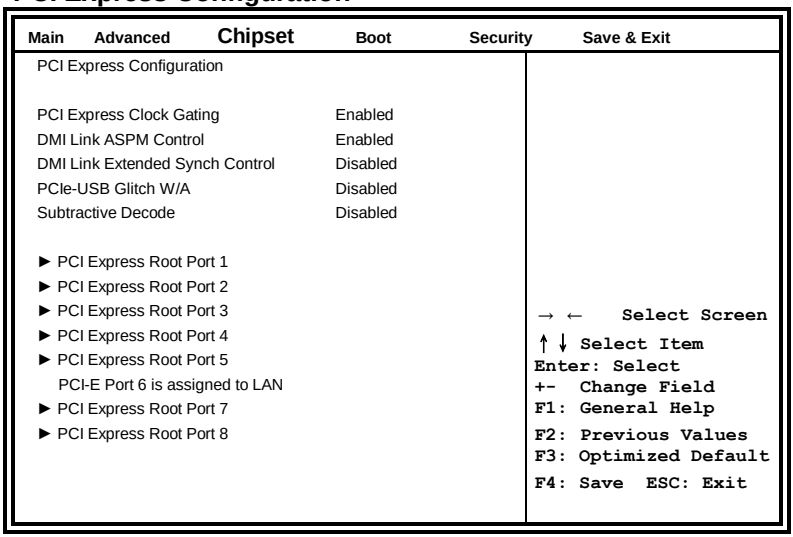
Enable or disable onboard NIC.

Wake on LAN
Enable or disable integrated LAN to wake the system. (The Wake On LAN cannot be disabled if ME is on at Sx state.)

SLP_S4 Assertion Width
Select a minimum assertion width of the SLP_S4# signal.

Restore AC Power Loss
Select AC power state when power is re-applied after a power failure.

PCI Express Configuration


Main Advanced Chipset Boot Security Save & Exit
PCI Express Configuration
PCI Express Clock Gating Enabled
DMI Link ASPM Control Enabled
DMI Link Extended Synch Control Disabled
PCIe-USB Glitch W/A Disabled
Subtractive Decode Disabled
► PCI Express Root Port 1
► PCI Express Root Port 2
► PCI Express Root Port 3
► PCI Express Root Port 4
► PCI Express Root Port 5
PCI-E Port 6 is assigned to LAN
► PCI Express Root Port 7
► PCI Express Root Port 8
→ ← Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

PCI Express Clock Gating
Enable or disable PCI Express Clock Gating for each root port.

DMI Link ASPM Control
The control of Active State Power Management on both NB side and SB side of the DMI link.

PCIe-USB Glitch W/A
PCIe-USB Glitch W/A for bad USB device(s) connected behind PCIE/PEG port.

USB Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
USB Configuration					
XHCI Pre-Boot Driver			Disabled		
xHCI Mode			Auto		
HS Port #1 Switchable			Enabled		
HS Port #2 Switchable			Enabled		
HS Port #3 Switchable			Enabled		
HS Port #4 Switchable			Enabled		
xHCI Streams			Enabled		
EHCI1			Enabled		
EHCI2			Enabled		
USB Ports Per-Port Disable Control			Disabled		

→ ← Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

HS Port #1/2/3/4 Switchable

Allows for HS port switching between xHCI and EHCI. If disabled, port is routed to EHCI. If HS port is routed to xHCI, the corresponding SS port is enabled.

xHCI Streams

Enable or disable xHCI Maximum Primary Stream Array Size.

EHCI1/2

Control the USAB EHCI (USB 2.0) functions. One EHCI controller must always be enabled.

USB Ports Per-Port Disable Control

Control each of the USB ports (0~13) disabling.

PCH Azalia Configuration

Main	Advanced	Chipset	Boot	Security	Save & Exit
PCH Azalia Configuration					
Azalia			Auto		

→ ← Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

Azalia

Control Detection of the Azalia device.
Disabled = Azalia will unconditionally disabled.
Enabled Azalia will be unconditionally enabled.
Auto = Azalia will enabled if present, disabled otherwise.

System Agent (SA) Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
System Agent Bridge Name			IvyBridge		
System Agent RC Version			1.1.0.0		
VT-d Capability			Supported		
VT-d			Enabled		
CHAP Device (B0:D7:F0)			Disabled		
Thermal Device (B0:D4:F0)			Disabled		
Enable NB CRID			Disabled		
BDAT ACPI Table Support			Disabled		
C-State Pre-Wake			Enabled		
► Graphics Configuration					
► Memory Configuration					

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

VT-d

Check to enable VT-d function on MCH.

Enable NB CRID

Enable or disable NB CRID WorkAround.

C-State Pre-Wake

Controls C-State Pre-Wake feature for ARAT, in SSKPD[57].

Graphics Configuration

Aptio Setup Utility

Main	Advanced	Chipset	Boot	Security	Save & Exit
Graphics Configuration					
IGFX VBIOS Version			2132		
IGfx Frequency			350 MHz		
Primary Display			Auto		
Internal Graphics			Auto		
GTT Size			2MB		
Aperture Size			256MB		
DVMT Pre-Allocated			64M		
DVMT Total Gfx Mode			Disabled		
► LCD Control					

→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

Primary Display
Select which of IGFX/PEG/PCI graphics device should be primary display or select SG for switchable Gfx.

Internal Graphics
Keep IGD enabled based on the setup options.

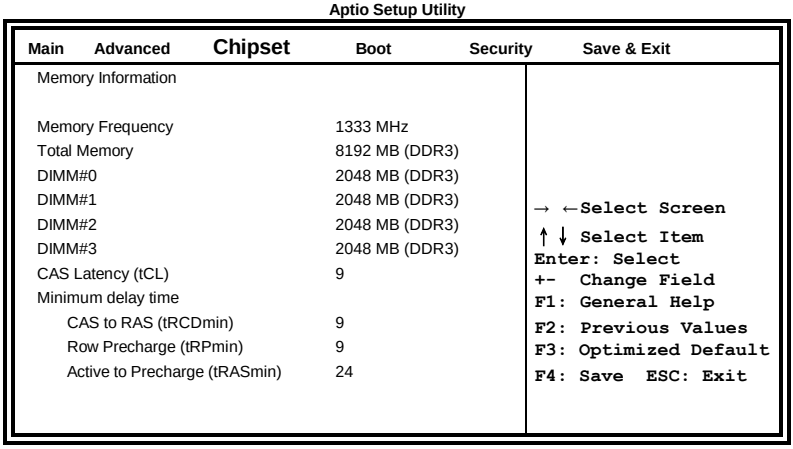
DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) graphics memory size used by the internal graphics device.

DVMT Total Gfx Mem
Select DVMT 5.0 total graphics memory size used by the internal graphics device.

Gfx Low Power Mode
This option is applicable for SFF only.

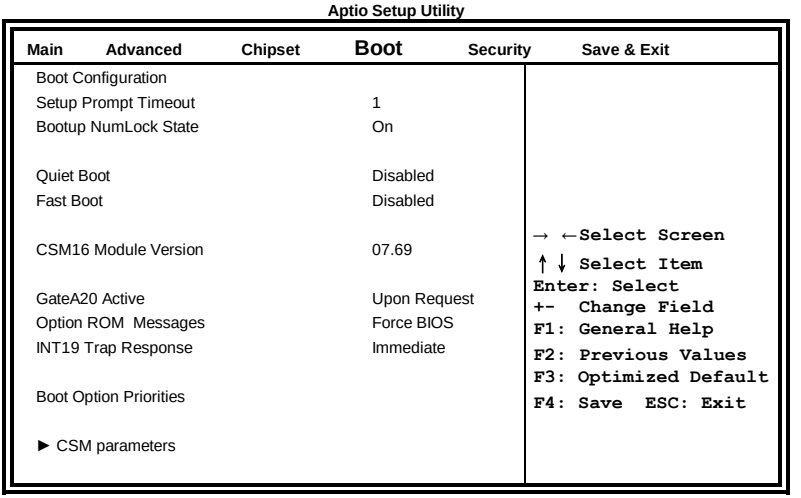
Primary IGFX Boot Display (LCD Control)
Select the Video Device that will be activated during POST. This has no effect if external graphics present. Secondary booty display selection will appear based on your selection. VGA modes will be supported only on primary display.

Memory Configuration



Boot Settings

This section allows you to configure the boot settings.



Setup Prompt Timeout

Number of seconds to wait for setup activation key.
65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables/Disables Quiet Boot option.

Fast Boot

Enables/Disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

GateA20 Active

UPON REQUEST – GA20 can be disabled using BIOS services.
ALWAYS – do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

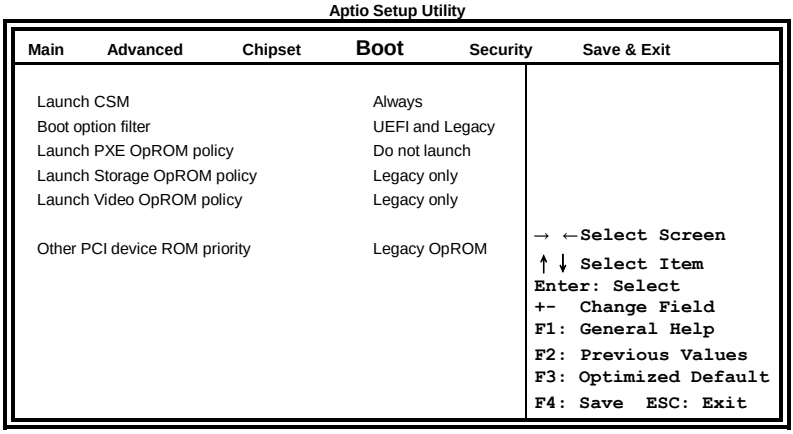
Option ROM Messages

Set display mode for Option ROM. Options are Force BIOS and Keep Current.

INT19 Trap Response
Enable: Allows Option ROMs to trap Int 19.

Boot Option Priorities
Sets the system boot order.

CSM parameters
This section allows you to configure the boot settings.



Boot option filter
This option controls what devices system can boot to.

Launch PXE OpROM policy
Controls the execution of UEFI and Legacy PXE OpROM.

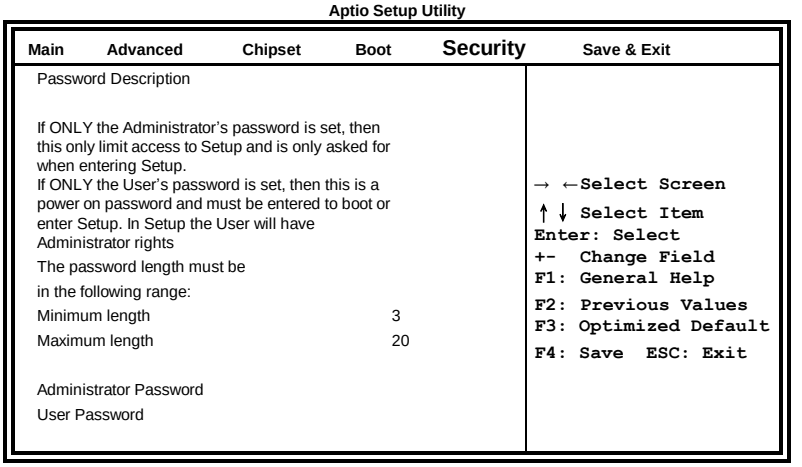
Launch Storatge OpROM policy
Controls the execution of UEFI and Legacy Storage OpROM.

Launch Video OpROM policy
Controls the execution of UEFI and Legacy Video OpROM.

Other PCI device ROM priority
For PCI devices other than Network, Mass storage or Video defines which OpROM to launch.

Security Settings

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.


Aptio Setup Utility
Main
Advanced
Chipset
Boot
Security
Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limit access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights
The password length must be
in the following range:
Minimum length
3
Maximum length
20
Administrator Password
User Password
→ ←Select Screen
↑ ↓ Select Item
Enter: Select
+- Change Field
F1: General Help
F2: Previous Values
F3: Optimized Default
F4: Save ESC: Exit

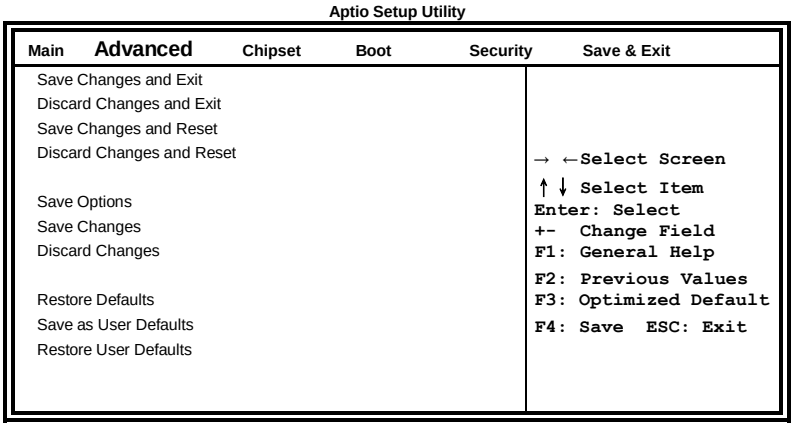
Administrator Password

Set Setup Administrator Password.

User Password

Set User Password.

Save & Exit Settings



Save Changes and Exit
Exit system setup after saving the changes.

Discard Changes and Exit
Exit system setup without saving any changes.

Save Changes and Reset
Reset the system after saving the changes.

Discard Changes and Reset
Reset system setup without saving any changes.

Save Changes
Save Changes done so far to any of the setup options.

Discard Changes
Discard Changes done so far to any of the setup options.

Restore Defaults
Restore/Load Defaults values for all the setup options.

Save as User Defaults
Save the changes done so far as User Defaults.

Restore User Defaults
Restore the User Defaults to all the setup options.

This is intentionally left blank.

Drivers Installation

This section describes the installation procedures for software and drivers. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

Intel Chipset Software Installation Utility 36
VGA Drivers Installation 39
Realtek HD Audio Driver Installation 42
LAN Drivers Installation 44
Intel® USB 3.0 Drivers 48

IMPORTANT NOTE:
After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

Intel Chipset Software Installation Utility

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation.

1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) 7 Series Chipset Drivers***.

2. Click ***Intel(R) Chipset Software Installation Utility.***

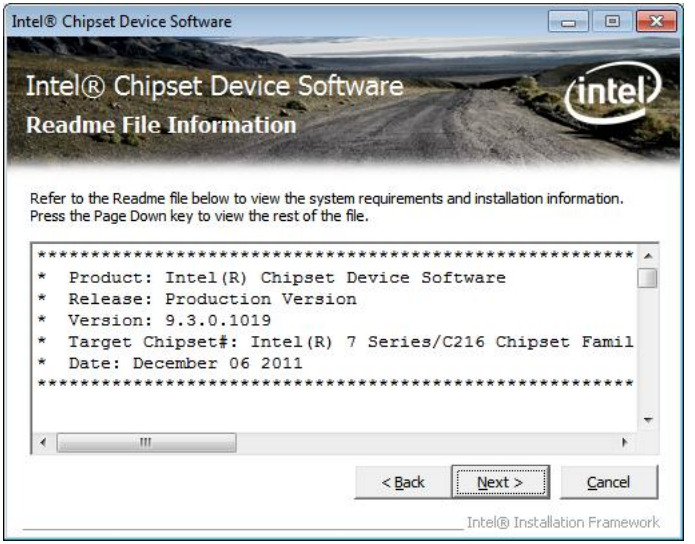
3. When the Welcome screen to the Intel® Chipset Device Software appears, click ***Next*** to continue.

Intel® Chipset Device Software
Intel® Chipset Device Software
Welcome to the Setup Program
This setup program will install the Intel® Chipset Device Software onto this computer. It is strongly recommended that you exit all programs before continuing.
< Back
Next >
Cancel
Intel® Installation Framework

4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.

Intel® Chipset Device Software
Intel® Chipset Device Software
License Agreement
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
< Back
Yes
No
Intel® Installation Framework

5. On the Readme File Information screen, click ***Next*** to continue the installation.


Intel® Chipset Device Software
Intel® Chipset Device Software
Readme File Information
Refer to the Readme file below to view the system requirements and installation information.
Press the Page Down key to view the rest of the file.
****
* Product: Intel(R) Chipset Device Software
* Release: Production Version
* Version: 9.3.0.1019
* Target Chipset#: Intel(R) 7 Series/C216 Chipset Famil
* Date: December 06 2011
****
< Back
Next >
Cancel
Intel® Installation Framework

6. The Setup process is now complete. Click ***Finish*** to restart the computer and for changes to take effect.

Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

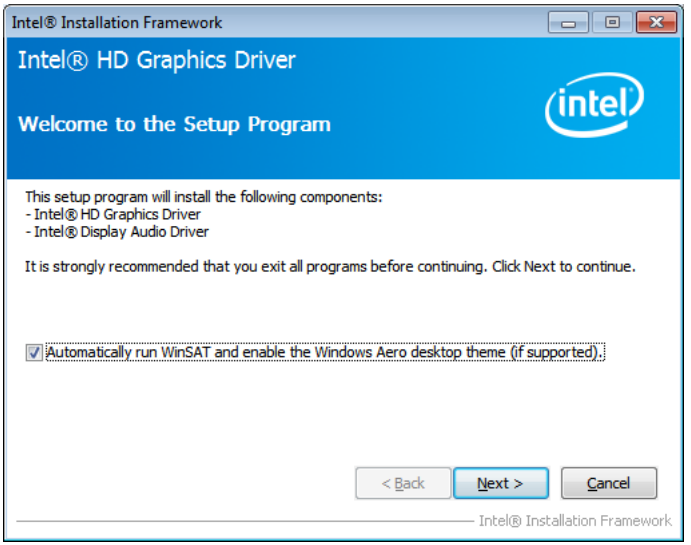
VGA Drivers Installation

NOTE: Before installing the *Intel(R) Q77 Chipset Family Graphics Driver,* the Microsoft .NET Framework 3.5 SPI should be first installed.

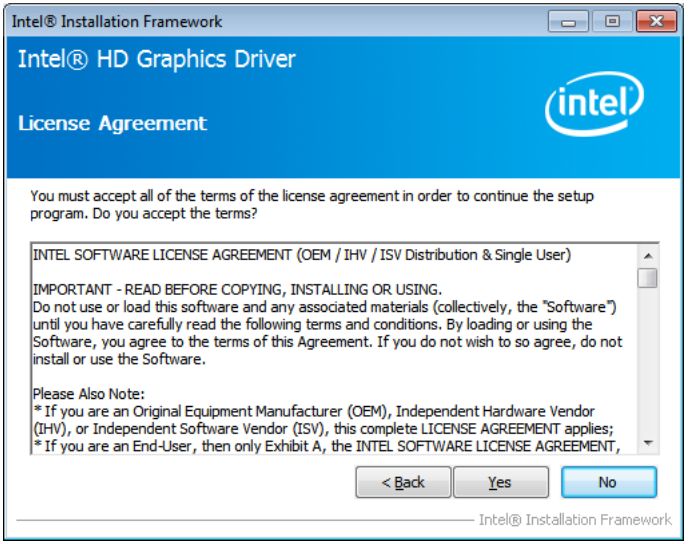
To install the VGA drivers, follow the steps below.
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

2. Click ***Intel(R) Q77 Chipset Family Graphics Driver.***

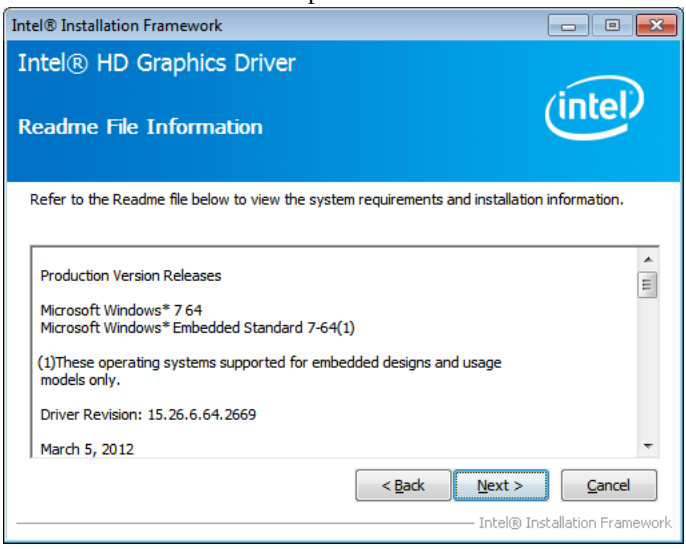
3. When the Welcome screen appears, click ***Next*** to continue.


Intel® Installation Framework
Intel® HD Graphics Driver
Welcome to the Setup Program
This setup program will install the following components:
- Intel® HD Graphics Driver
- Intel® Display Audio Driver
It is strongly recommended that you exit all programs before continuing. Click Next to continue.
Automatically run WinSAT and enable the Windows Aero desktop theme (if supported).
< Back
Next >
Cancel
Intel® Installation Framework

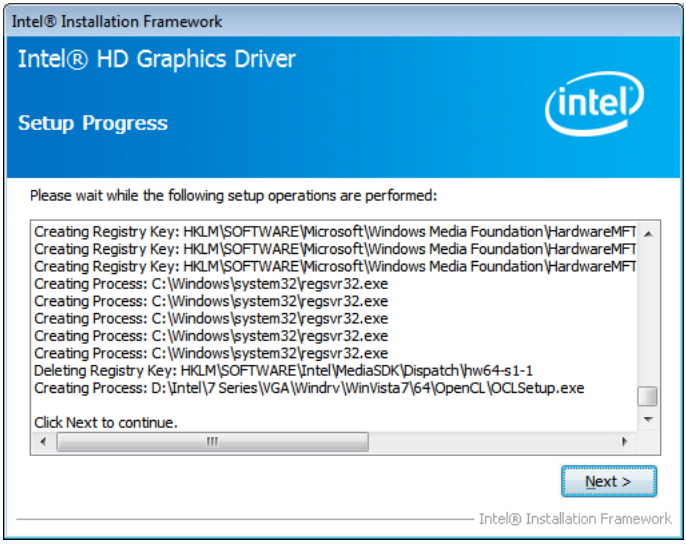
4. Click ***Yes*** to to agree with the license agreement and continue the installation.


Intel® Installation Framework
Intel® HD Graphics Driver
License Agreement
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,
< Back
Yes
No
Intel® Installation Framework

5. On the Readme File Information screen, click ***Next*** to continue the installation of the Intel® Graphics Media Accelerator Driver.


Intel® Installation Framework
Intel® HD Graphics Driver
Readme File Information
Refer to the Readme file below to view the system requirements and installation information.
Production Version Releases
Microsoft Windows* 7 64
Microsoft Windows* Embedded Standard 7-64(1)
(1)These operating systems supported for embedded designs and usage models only.
Driver Revision: 15.26.6.64.2669
March 5, 2012
< Back
Next >
Cancel
Intel® Installation Framework

6. On Setup Progress screen, click ***Next*** to continue.


Intel® Installation Framework
Intel® HD Graphics Driver
Setup Progress
Please wait while the following setup operations are performed:
Creating Registry Key: HKLM\SOFTWARE\Microsoft\Windows Media Foundation\HardwareMFT
Creating Registry Key: HKLM\SOFTWARE\Microsoft\Windows Media Foundation\HardwareMFT
Creating Registry Key: HKLM\SOFTWARE\Microsoft\Windows Media Foundation\HardwareMFT
Creating Process: C:\Windows\system32\regsvr32.exe
Creating Process: C:\Windows\system32\regsvr32.exe
Creating Process: C:\Windows\system32\regsvr32.exe
Creating Process: C:\Windows\system32\regsvr32.exe
Creating Process: C:\Windows\system32\regsvr32.exe
Deleting Registry Key: HKLM\SOFTWARE\Intel\MediaSDK\Dispatch\hw64-s1-1
Creating Process: D:\Intel\7 Series\VGA\Windrv\WinVista7\64\OpenCL\OCLSetup.exe
Click Next to continue.
Next >
Intel® Installation Framework

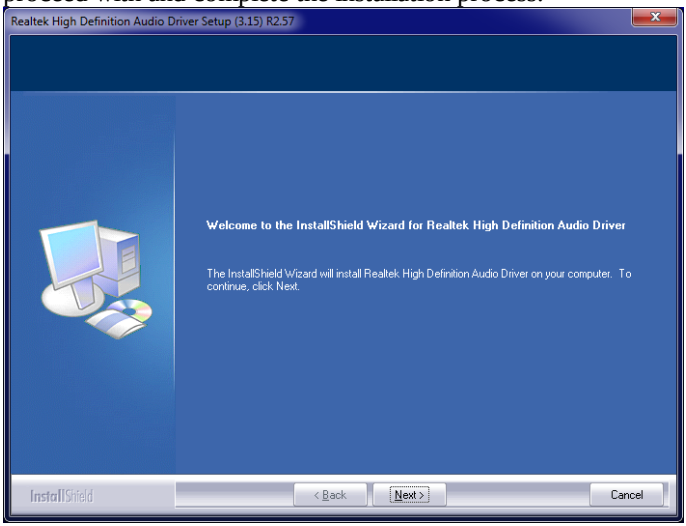
7. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.

Realtek HD Audio Driver Installation

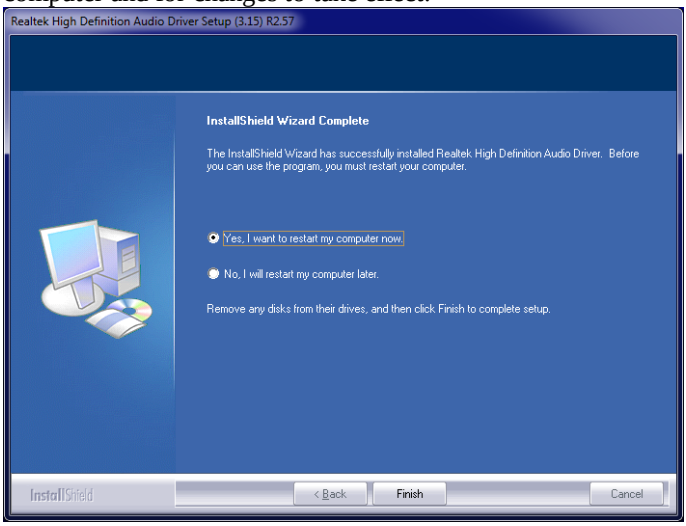
Follow the steps below to install the Realtek HD Audio Drivers.
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

2. Click ***Realtek High Definition Audio Driver.***

3. On the Welcome to the InstallShield Wizard screen, click ***Next*** to proceed with and complete the installation process.


Realtek High Definition Audio Driver Setup (3.15) R2.57
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver
The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

4. The InstallShield Wizard Complete. Click ***Finish*** to restart the computer and for changes to take effect.

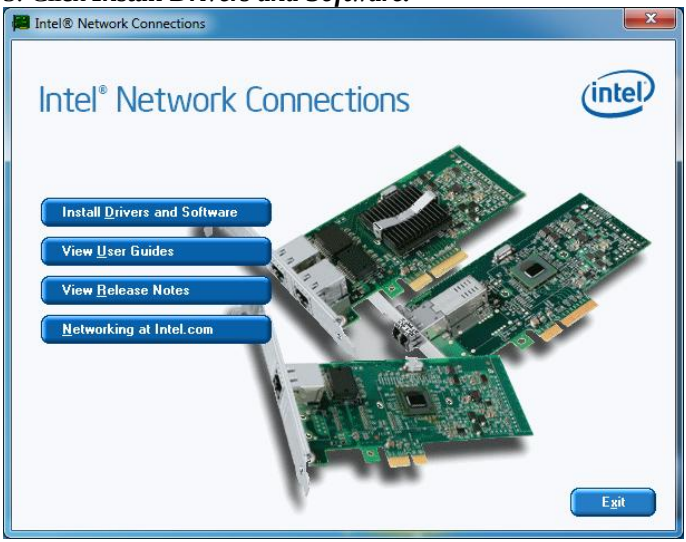

Realtek High Definition Audio Driver Setup (3.15) R2.57
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Realtek High Definition Audio Driver. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

LAN Drivers Installation

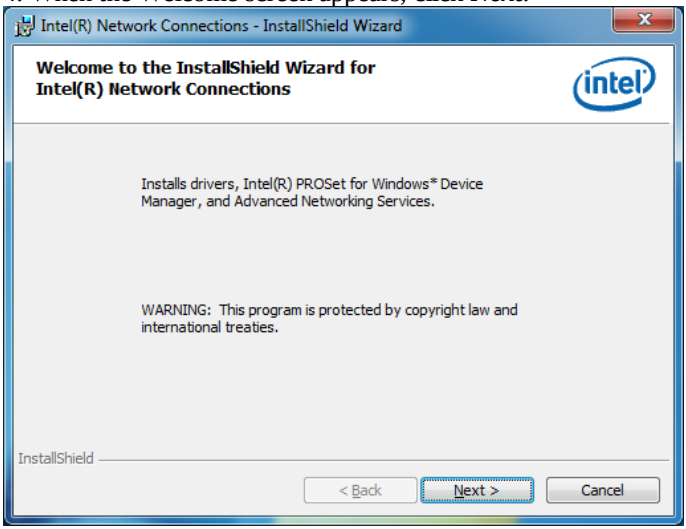
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

2. Click ***Intel(R) PRO LAN Network Driver.***

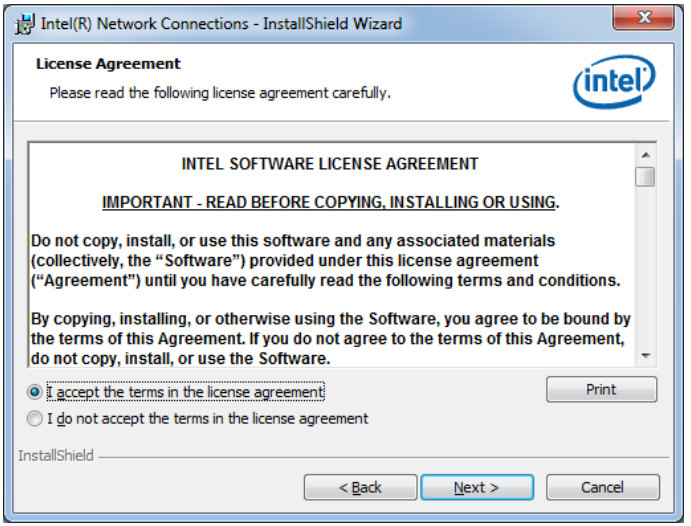
3. Click ***Install Drivers and Software.***



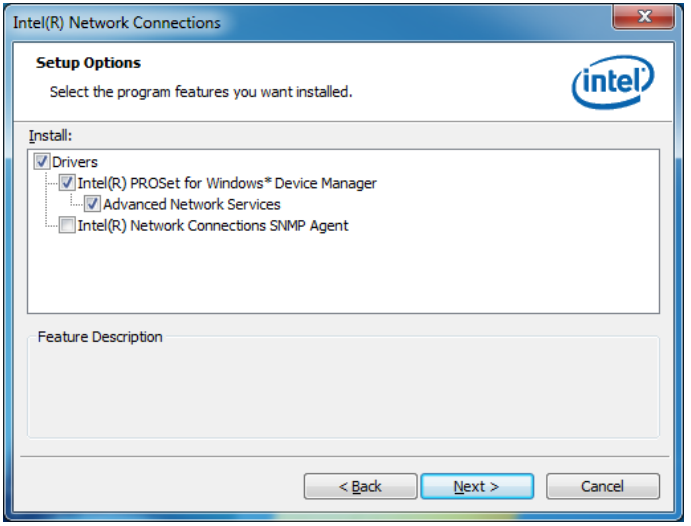
4. When the Welcome screen appears, click ***Next***.


Intel(R) Network Connections - InstallShield Wizard
Welcome to the InstallShield Wizard for
Intel(R) Network Connections
intel
Installs drivers, Intel(R) PROSet for Windows* Device Manager, and Advanced Networking Services.
WARNING: This program is protected by copyright law and international treaties.
InstallShield
< Back
Next >
Cancel

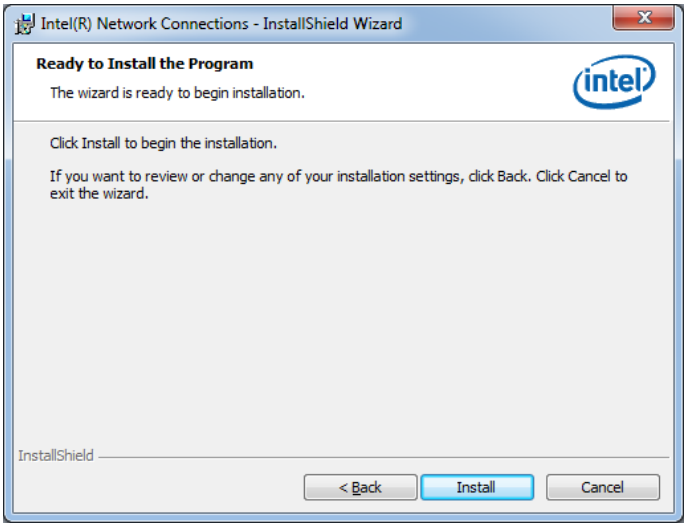
5. Click ***Next*** to to agree with the license agreement.


Intel(R) Network Connections - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not copy, install, or use this software and any associated materials (collectively, the "Software") provided under this license agreement ("Agreement") until you have carefully read the following terms and conditions.
By copying, installing, or otherwise using the Software, you agree to be bound by the terms of this Agreement. If you do not agree to the terms of this Agreement, do not copy, install, or use the Software.
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

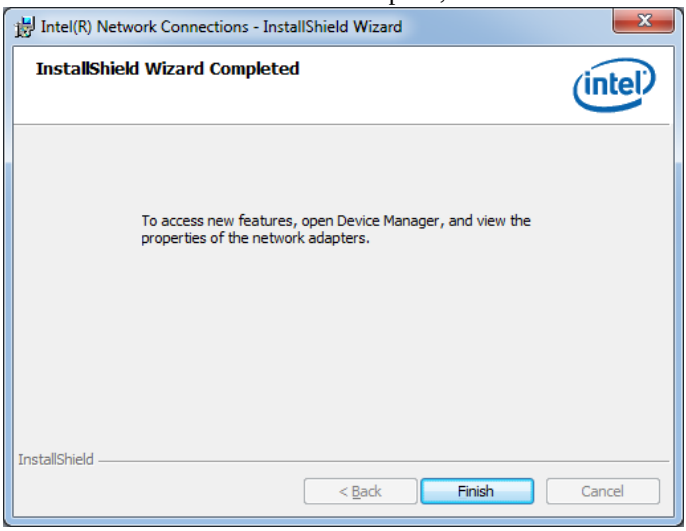
6. Click the checkbox for **Drivers** in the Setup Options screen to select it and click **Next** to continue.



7. The wizard is ready to begin installation. Click ***Install*** to begin the installation.


Intel(R) Network Connections - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

8. When InstallShield Wizard is complete, click ***Finish***.

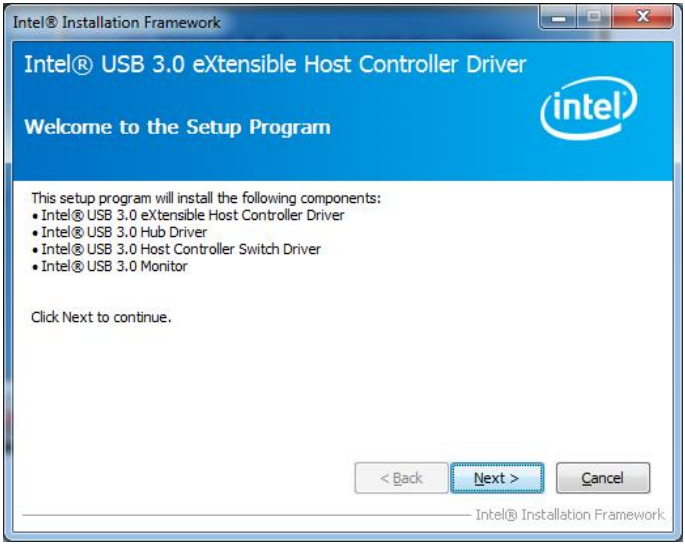

Intel(R) Network Connections - InstallShield Wizard
InstallShield Wizard Completed
To access new features, open Device Manager, and view the properties of the network adapters.
InstallShield
< Back
Finish
Cancel

Intel® USB 3.0 Drivers

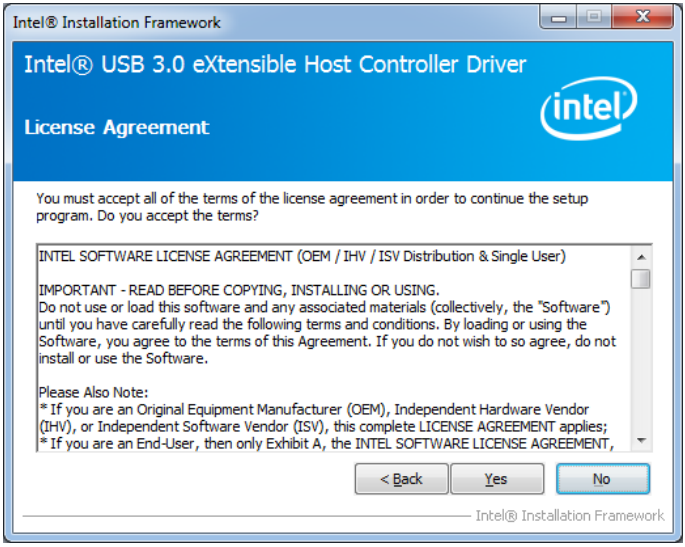
1. Insert the CD that comes with the board. Click ***Intel*** and then ***Intel(R) Q7 Series Chipset Drivers***.

2. Click ***Intel(R) USB 3.0 Drivers.***

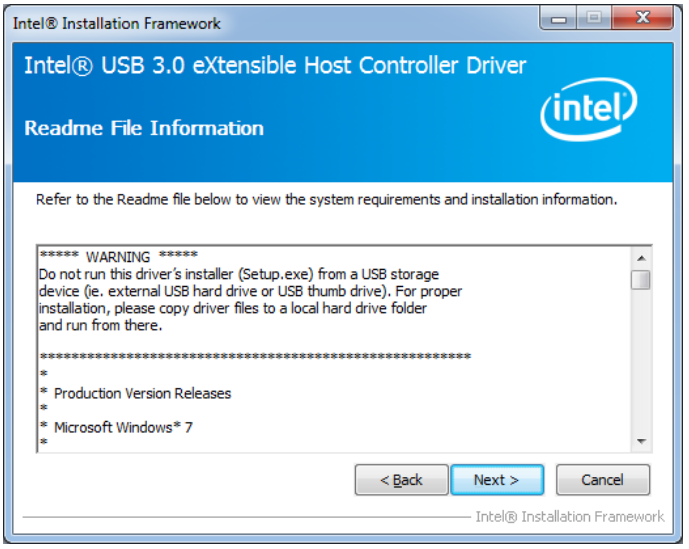
3. When the Welcome screen to the InstallShield Wizard for Intel® USB 3.0 eXtensible Host Controller Driver, click ***Next***.


Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Welcome to the Setup Program
intel
This setup program will install the following components:
• Intel® USB 3.0 eXtensible Host Controller Driver
• Intel® USB 3.0 Hub Driver
• Intel® USB 3.0 Host Controller Switch Driver
• Intel® USB 3.0 Monitor
Click Next to continue.
< Back
Next >
Cancel
Intel® Installation Framework

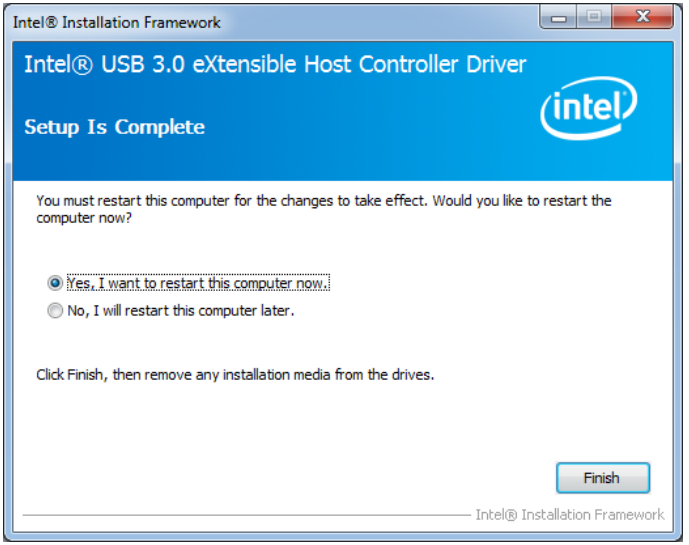
4. Click ***Yes*** to to agree with the license agreement and continue the installation.


Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,
< Back
Yes
No
Intel® Installation Framework

5. On the Readme File Information screen, click ***Next*** to continue the installation of the Intel® USB 3.0 eXtensible Host Controller Driver.


Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Readme File Information
Refer to the Readme file below to view the system requirements and installation information.
***** WARNING *****
Do not run this driver's installer (Setup.exe) from a USB storage
device (ie. external USB hard drive or USB thumb drive). For proper
installation, please copy driver files to a local hard drive folder
and run from there.
****
*
* Production Version Releases
*
* Microsoft Windows* 7
*
< Back
Next >
Cancel
Intel® Installation Framework

6. Setup complete. Click ***Finish*** to restart the computer and for changes to take effect.


Intel® Installation Framework
Intel® USB 3.0 eXtensible Host Controller Driver
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

Appendix

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
000h - 01Fh	DMA Controller #1
020h - 03Fh	Interrupt Controller #1
040h - 05Fh	Timer
060h - 06Fh	Keyboard Controller
070h - 07Fh	Real Time Clock, NMI
080h - 09Fh	DMA Page Register
0A0h - 0BFh	Interrupt Controller #2
0C0h - 0DFh	DMA Controller #2
0F0h	Clear Math Coprocessor Busy Signal
0F1h	Reset Math Coprocessor
1F0h - 1F7h	IDE Interface
278h - 27Fh	Parallel Port #2(LPT2)
2E8h – 2EFh	Serial Port #4(COM4)
2F8h - 2FFh	Serial Port #2(COM2)
2B0h- 2DFh	Graphics adapter Controller
360h - 36Fh	Network Ports
3B0h - 3BFh	Monochrome & Printer adapter
3C0h - 3CFh	EGA adapter
3D0h - 3DFh	CGA adapter
3E8h – 3EFh	Serial Port #3(COM3)
3F8h - 3FFh	Serial Port #1(COM1)

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ0	System Timer Output
IRQ1	Keyboard
IRQ2	Interrupt Cascade
IRQ3	Serial Port #2
IRQ4	Serial Port #1
IRQ5	Reserved
IRQ6	Reserved
IRQ7	Reserved
IRQ8	Real Time Clock
IRQ9	Reserved
IRQ10	Serial Port #3
IRQ11	Serial Port #4
IRQ12	PS/2 Mouse
IRQ13	80287
IRQ14	Primary IDE
IRQ15	Secondary IDE

C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "F81865.H"
//---------------------------------------------------------------------------
int main (int argc, char *argv[]);
void EnableWDT(int);
void DisableWDT(void);
//---------------------------------------------------------------------------
int main (int argc, char *argv[])
{
        unsigned char bBuf;
        unsigned char bTime;
        char **endptr;

        char SIO;

        printf("Fintek 81865 watch dog program\n");

        SIO = Init_F81865();
        if (SIO == 0)
        {
                printf("Can not detect Fintek 81865, program abort.\n");
                return(1);
        }//if (SIO == 0)

        if (argc != 2)
        {
                printf(" Parameter incorrect!!\n");
                return (1);
        }

        bTime = strtol (argv[1], endptr, 10);
        printf("System will reset after %d seconds\n", bTime);

        if (bTime)
        {       EnableWDT(bTime); }
        else
        {       DisableWDT();       }

        return 0;
```

```
}
//---------------------------------------------------------------------------
void EnableWDT(int interval)
{
	unsigned char bBuf;

	bBuf = Get_F81865_Reg(0x2B);
	bBuf &= (~0x20);
	Set_F81865_Reg(0x2B, bBuf);			//Enable WDTO

	Set_F81865_LD(0x07);				//switch to logic device 7
	Set_F81865_Reg(0x30, 0x01);			//enable timer

	bBuf = Get_F81865_Reg(0xF5);
	bBuf &= (~0x0F);
	bBuf |= 0x52;
	Set_F81865_Reg(0xF5, bBuf);			//count mode is second

	Set_F81865_Reg(0xF6, interval);		//set timer

	bBuf = Get_F81865_Reg(0xFA);
	bBuf |= 0x01;
	Set_F81865_Reg(0xFA, bBuf);			//enable WDTO output

	bBuf = Get_F81865_Reg(0xF5);
	bBuf |= 0x20;
	Set_F81865_Reg(0xF5, bBuf);			//start counting
}
//---------------------------------------------------------------------------
void DisableWDT(void)
{
	unsigned char bBuf;

	Set_F81865_LD(0x07);				//switch to logic device 7

	bBuf = Get_F81865_Reg(0xFA);
	bBuf &= ~0x01;
	Set_F81865_Reg(0xFA, bBuf);			//disable WDTO output

	bBuf = Get_F81865_Reg(0xF5);
	bBuf &= ~0x20;
	bBuf |= 0x40;
	Set_F81865_Reg(0xF5, bBuf);			//disable WDT
}
//---------------------------------------------------------------------------
```

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include "F81865.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81865_BASE;
void Unlock_F81865 (void);
void Lock_F81865 (void);
//---------------------------------------------------------------------------
unsigned int Init_F81865(void)
{
        unsigned int result;
        unsigned char ucDid;

        F81865_BASE = 0x4E;
        result = F81865_BASE;

        ucDid = Get_F81865_Reg(0x20);
        if (ucDid == 0x07)                                      //Fintek 81865
        {       goto Init_Finish;       }

        F81865_BASE = 0x2E;
        result = F81865_BASE;

        ucDid = Get_F81865_Reg(0x20);
        if (ucDid == 0x07)                                      //Fintek 81865
        {       goto Init_Finish;       }

        F81865_BASE = 0x00;
        result = F81865_BASE;

Init_Finish:
        return (result);
}
//---------------------------------------------------------------------------
void Unlock_F81865 (void)
{
        outportb(F81865_INDEX_PORT, F81865_UNLOCK);
        outportb(F81865_INDEX_PORT, F81865_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_F81865 (void)
{
        outportb(F81865_INDEX_PORT, F81865_LOCK);
}
//---------------------------------------------------------------------------
void Set_F81865_LD( unsigned char LD)
{
        Unlock_F81865();
        outportb(F81865_INDEX_PORT, F81865_REG_LD);
        outportb(F81865_DATA_PORT, LD);
        Lock_F81865();
}
//---------------------------------------------------------------------------
void Set_F81865_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_F81865();
        outportb(F81865_INDEX_PORT, REG);
        outportb(F81865_DATA_PORT, DATA);
        Lock_F81865();
}
//---------------------------------------------------------------------------
unsigned char Get_F81865_Reg(unsigned char REG)
```

```
{
        unsigned char Result;
        Unlock_F81865();
        outportb(F81865_INDEX_PORT, REG);
        Result = inportb(F81865_DATA_PORT);
        Lock_F81865();
        return Result;
}
//-----------------------------------------------------------------------------
```

```
//-----------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----------------------------------------------------------------------------
#ifndef __F81865_H
#define __F81865_H                     1
//-----------------------------------------------------------------------------
#define         F81865_INDEX_PORT               (F81865_BASE)
#define         F81865_DATA_PORT                (F81865_BASE+1)
//-----------------------------------------------------------------------------
#define         F81865_REG_LD                   0x07
//-----------------------------------------------------------------------------
#define F81865_UNLOCK                   0x87
#define         F81865_LOCK                             0xAA
//-----------------------------------------------------------------------------
unsigned int Init_F81865(void);
void Set_F81865_LD( unsigned char);
void Set_F81865_Reg( unsigned char, unsigned char);
unsigned char Get_F81865_Reg( unsigned char);
//-----------------------------------------------------------------------------
#endif  //__F81865_H
```